FUJICA AX-5

Similar models: AX-1, AX-3

Battery: 1 ea. 6V PX28 or 544 (negative ground)

Fig. 1—top cover removed

Fig. 2—bottom cover removed

Fig. 3—front view, lens removed

Fig. 4—front view, mirror box removed

Fig. 5—mirror-box/front-plate assembly

Fig. 6—mirror box, wind side

Fig. 7—mirror box, bottom view

Fig. 8—shutter assembly

Fig. 9—f-value resistor, timing for reassembly

Fig. 10—transport mechanism, timing points

Fig. 11—E3 IC, pin voltages and test points

Fig. 12—magnet (M) board, wiring and test points

Fig. 13—wiring pictorial, new-style flex

Fig. 14—wiring pictorial, old-style flex

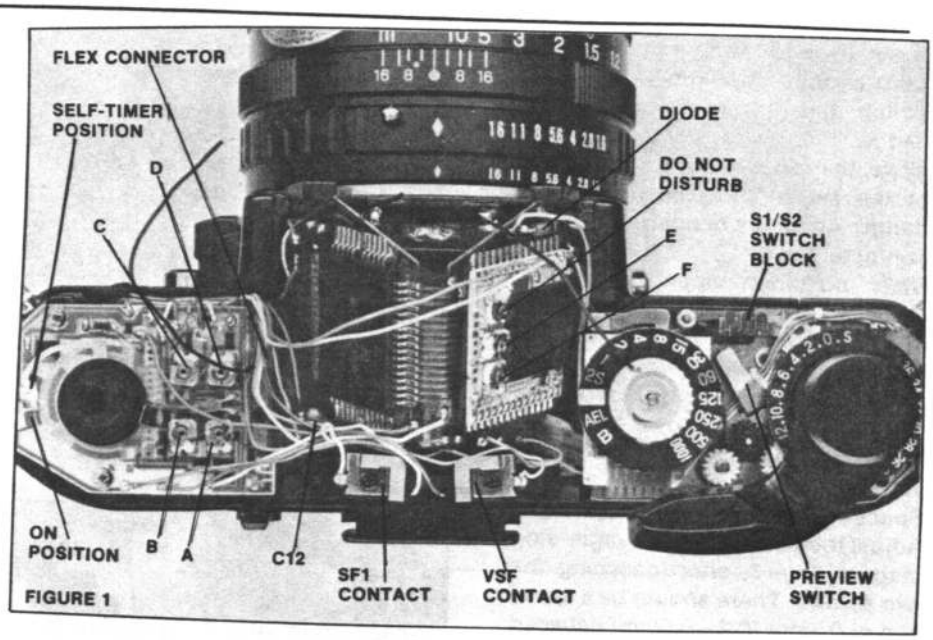

FIGURE 1

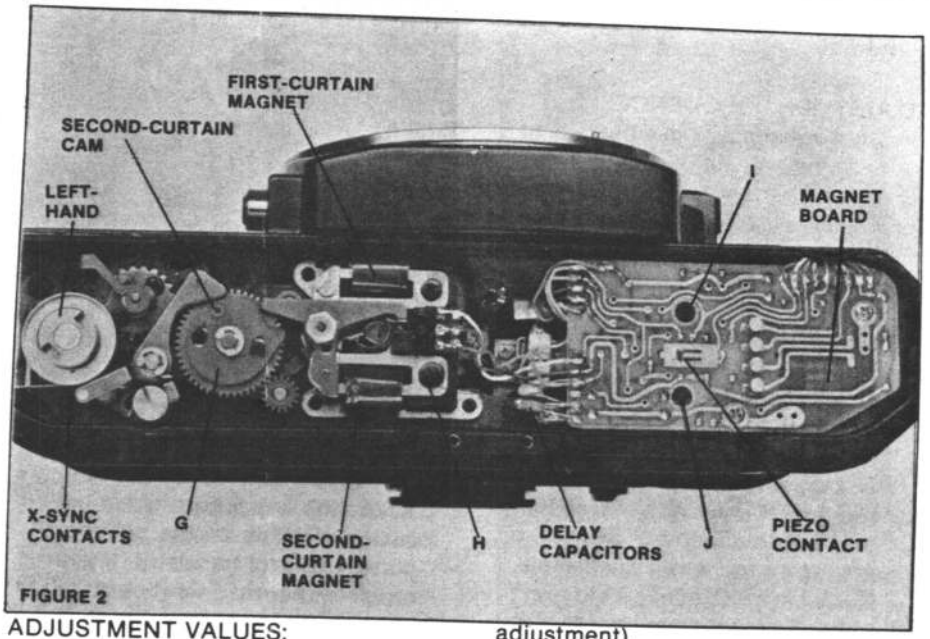

FIGURE 2

ADJUSTMENT LOCATIONS:

Auto exposure	A
Auto-strobe signal	B
Readout, f/stop	C
Step voltage	D
Shutter speed, slope	E
Shutter speed, level	F
Curtain overlap	G
Depth of engagement, second-curtain latch	H
Travel time, second curtain	I
Travel time, first curtain	J
Mirror angle	K
Start position, diaphragm-closing lever	L
Space gap, diaphragm-stop lever	M

ADJUSTMENT VALUES:

Curtain-travel time: 12ms (34mm distance), 11.3ms (32mm distance)

Flange-focal distance: 43.45 +0.025, -0.015mm (flange to film-guide rails)

Curtain overlap: 1 bar with curtains at middle of aperture. Rotating the second-curtain cam, Fig. 2, changes the overlap (clockwise to decrease).

Auto-strobe signal: 1.3V + 15mv at f/5.6, ASA 100 (measured between ground and the VSF contact, Fig. 1)

Battery test: With 4V applied, the LED opposite "B" should flicker. The LED should turn off with 4.5V applied (no adjustment).

X-contact delay: 0.4 - 2ms

Voltage for checking magnets: 3V (the magnets should operate with 3V applied directly across their coils)

Engagement, second-curtain latch: With the shutter cocked, the second-curtain latch should engage the lug on the second-curtain cam at least half way (half the width of the latch end). But the second-curtain latch should not bottom on the cam. To adjust, loosen the screw holding the second-curtain magnet. Shift the magnet core toward the curtain gears

to decrease the engagement or away from the curtain gears to increase the engagement.

Auto f/stop switch: The two switch contacts should close when the lens is set to auto diaphragm (diamond calibration). With the end of the switch pin 0.4mm from the lens flange, the switch contacts should close; they should open with the end of the switch pin 0.8mm from the flange. Adjust by bending the switch contacts, Fig. 5.

Start position, diaphragm-closing lever: With one edge of the diaphragm-stop lever against the slotted adjustment post, Fig. 7, the other edge should be 3.7mm from the pivot of the segment gear. Adjust by spreading or compressing the slotted stop post.

Space gap, diaphragm-stop lever: Adjust the end of the diaphragm-stop magnet, Fig. 7, after loosening the two screws. There should be a space gap of 0.3mm (0.2 – 0.5mm) between the ratchet stop gear and the tip of the stop lever.

ADJUSTMENT SEQUENCE:

1. Step voltage. Expose the lens to a constant light source and measure the voltage at pin 33 of E3, Fig. 11. The voltage should go more positive as you get smaller f/stops. For each f/stop change, the voltage should change 48mv. For example, if you change from f/5.6 to f/8, the voltage should go 48mv more positive. Turning the wiper of D counterclockwise increases the voltage change.
2. Readout, f/stop. Adjust C so that the readout agrees with the setting on the lens. For example, if you set f/8, the yellow LED next to the f/8 calibration should turn on.
3. Shutter-speed level. Set 2 seconds. Adjust F for a 2-second shutter speed.
4. Shutter-speed slope. Set 1/1000. Adjust E so that the shutter delivers 1/1000 (0.7 - 1.38ms).
5. Auto-strobe signal. Set ASA 100, f/5.6. Measure the voltage to the yellow-wire dedicated-flash contact with S1 closed. Adjust B for a voltage of 1.3V + 15mv.
6. Auto exposure. Set AE and f/5.6. Adjust A for a 0 EV error.

   Note: Fujica used delay capacitors on the magnet board,

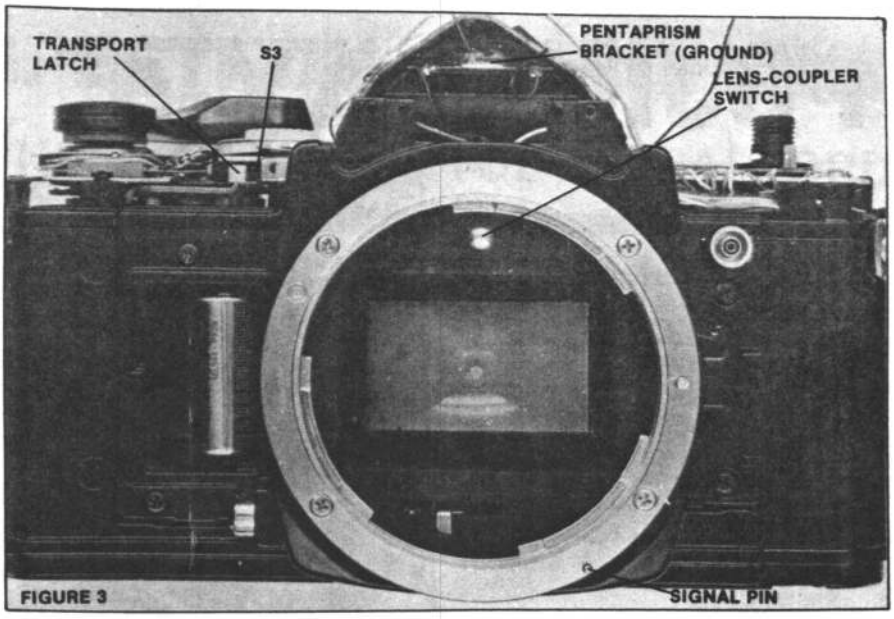

FIGURE 3

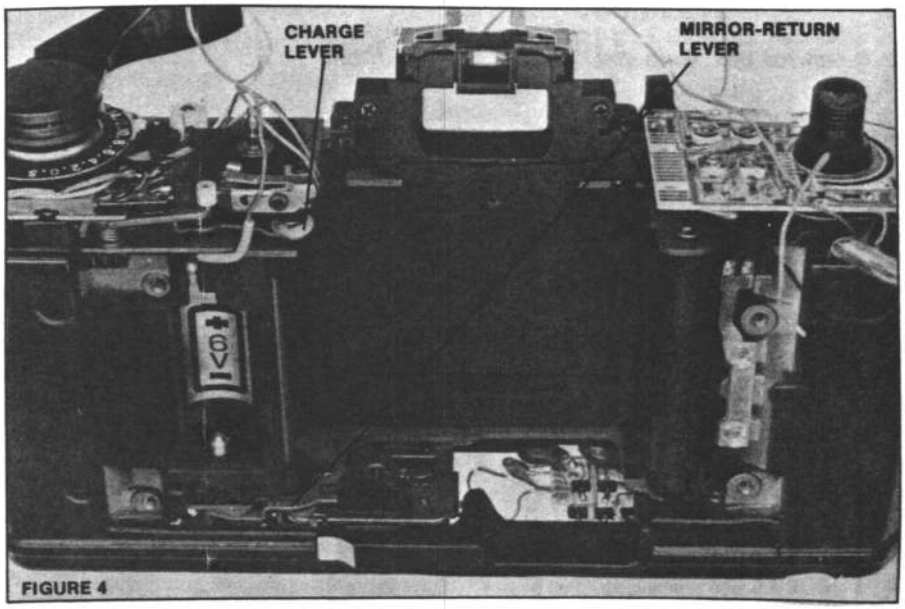

FIGURE 4

Fig. 2, to correct 1/1000 and 1/500; the capacitors delay the switch-off time of the second-curtain control transistor. If you replace the magnet board or change the mechanical curtain adjustments, you may have to change capacitance values to correct 1/1000 and 1/500. For example, if 1/500 checks too fast, you can increase the capacitance value of a delay capacitor. Fujica supplies the following capacitors for adjustment:

Part #	Capacitance	Color Code
116K278600	0.047 microfarad	red
116K278610	0.068 microfarad	violet
116K278620	0.1 microfarad	yellow
116K278570	0.22 microfarad	gray
116K278910	0.33 microfarad	orange
116K278640	0.47 microfarad	green

TIMING, TRANSPORT GEARS:

1. With the transport latch engaged, Fig. 10, the flat sides of the wind shaft (lower end) should be perpendicular to the body center line (parallel to the ends of the camera body). Lift the transport-cam assembly to change the timing. Also, the flat sides of the sprocket shaft, Fig. 10, should be perpendicular to the body center line (sprocket timing). To check, disengage the transport latch and rotate the sprocket. Note the sprocket-shaft position when the transport latch once again engages the cam. Once in every three cocking strokes, the flat sides of the sprocket shaft should be perpendicular to the body center line. After timing the transport-

cam assembly, install the ratchet gear with its timing hole pointing to the center of the camera.

2. To seat the upper mechanism plate, it's necessary to hold both the advance pawl and the stop pawl, Fig. 10, against their respective spring tensions. The advance pawl must engage the upper teeth of the ratchet gear; the stop pawl must engage the smaller notch in the transport cam.

OPERATION CHECKPOINTS:

1. Operation modes and LED display. The AX-5 has four separate operational modes — aperture-preferred, shutter-speed preferred, programmed, and manual. Settings and proper LED readouts are as follows:

a. Programmed. Set the diaphragm-setting ring of the lens to the diamond index; set the speed dial to AE or AEL (auto-exposure lock). The "P" mode LED should turn on when you push the release button part way or push the preview button (the white button to the front of the release button). At AE, both the f/stop LED and the shutter-speed LED should change as you change the light level; at AEL, the display should lock in place as long as you keep the release button partially depressed. The camera now programs both the diaphragm opening and the shutter speed automatically. At ASA 100, the display should read f/11 and 1/250 at EV 15; it should read f/4 and 1/30 at EV 9. For overexposure warning, the LED opposite "1000" flickers; for underexposure warning, the LED opposite "2S" flickers.

b. Aperture-preferred. Set the speed dial to AE or to AEL; set the diaphragm-setting ring to the desired f/stop. The "F" mode LED should now turn on. The shutter-speed LED should change as you change the light level to indicate what shutter speed the camera will automatically program. The f/stop LED should agree with the lens setting.

c. Shutter-speed preferred. Turn the diaphragm-setting ring to the diamond index; set the speed dial to the desired shutter speed. The "T" mode LED should turn on. The f/stop LED should change as you vary the light level to indicate the f/stop which the camera will automatically program; the shutter-speed LED should agree with the speed-dial setting. If the yellow LED at the top or bottom of the scale turns on and flickers, the camera can't program the proper aperture for the shutter speed selected. However, the camera should still provide proper exposure by automatically changing the shutter speed.

d. Manual. Set the diaphragm-setting ring to the desired f/stop; set the speed dial to the desired shutter speed. The f/stop LED should agree with the diaphragm setting: the shutter-speed LED should agree with the shutter-speed setting. The flickering f/stop LED indicates the proper diaphragm setting for the combination of shutter-speed setting and light level. By turning the diaphragm-setting ring until the steady LED coincides with the flickering LED, you set the proper exposure combination.

2. Checking for proper operation with dedicated flash:

a. Check for the proper voltage at the VSF contact, Fig. 1 (1.3V at ASA 100 and f/5.6).

b. Set AE. The shutter-speed LED should switch to "60" when you short between ground and the Sf1 contact, Fig. 1.

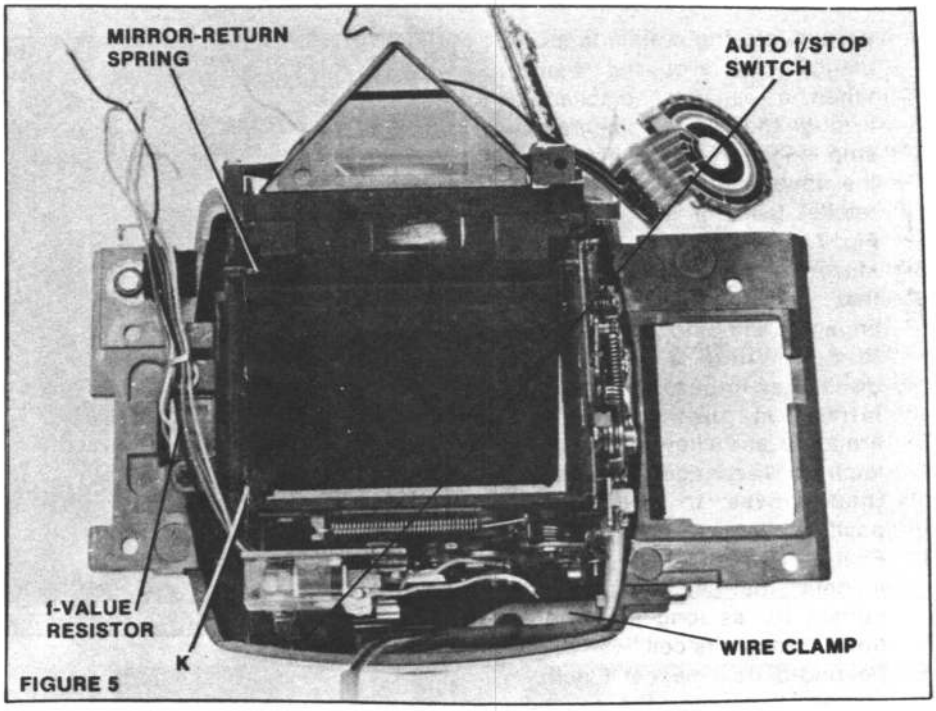

FIGURE 5

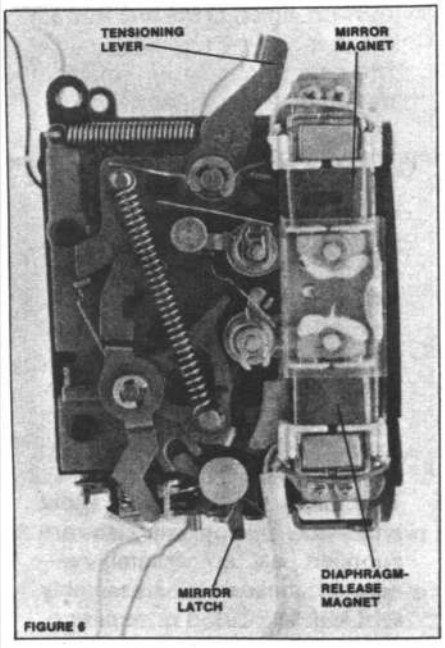

FIGURE 6

BASIC CIRCUIT OPERATION AND COMPONENT REPLACEMENT:

The AX-5 uses three hybrid magnets (permanent magnet plus coil) and two electromagnets:

1. Diaphragm-release magnet. Hybrid magnet that releases the diaphragm-closing mechanism when a capacitor discharges through the magnet coil.
2. Diaphragm-stop magnet. Hybrid magnet that arrests the dia-

phragm-closing system to automatically control the f/stop. When a capacitor discharges through the coil, the diaphragm-stop magnet repels its armature; the armature then engages the ratchet teeth of the stop gear, Fig. 7.

3. Mirror magnet. Hybrid magnet that holds the mirror latch engaged with the mirror-lifting lever. When a capacitor discharges through the coil, the mirror magnet repels its armature and allows the mirror latch to disengage. The mirror then moves to the raised position.
4. First-curtain magnet. Electromagnet that holds the first curtain for as long as current flows through its coil.
5. Second-curtain magnet. Electromagnet that holds the second curtain for the length of the exposure. The delay between the turn-off signal at the first-curtain magnet and the turn-off signal at the second-curtain magnet determines the shutter speed.

Replacement parts:

1. The first-curtain magnet and the second-curtain magnet are supplied as an assembly — magnet base plate assembly #46A2022710. To replace, unsolder the three wires from the magnet board, Fig. 12, and remove the three screws. A replacement assembly comes with the red, white, and gray wires already connected to the coils.
2. The diaphragm-release magnet and the mirror magnet are supplied as an assembly — magnet base plate assembly #46A2359500. To replace, remove the side panel of the mirror box, Fig. 6; three screws at the back of the panel hold the magnet base assembly.
3. The diaphragm-stop magnet, Fig. 7, is supplied individually — slow governor assembly #46A2359320. If you replace, note adjustment M.

Circuit modules:

1. All five magnets connect to the magnet board at the bottom of the camera. The magnet board (M-circuit board assembly #110A2033630) includes the switching transistors and the capacitors for the hybrid magnets.
2. The linear amplifier ICs mount to the underside of the E1 amplifier board, Fig. 13 (E1 circuit assembly #106A2033620). The outputs of the E1 amplifier are analog signals that vary according to the amount of light, the f/stop setting, the shutter-speed setting, and the film-speed setting.
3. The digital ICs mount to the flex circuit, Fig. 13 (E3 circuit assembly #110A1567400). E3 receives the analog signals from the E1 amplifier and converts them to digital signals which drive the magnets and LEDs. E3 also supplies the oscillator signal that times the functions.

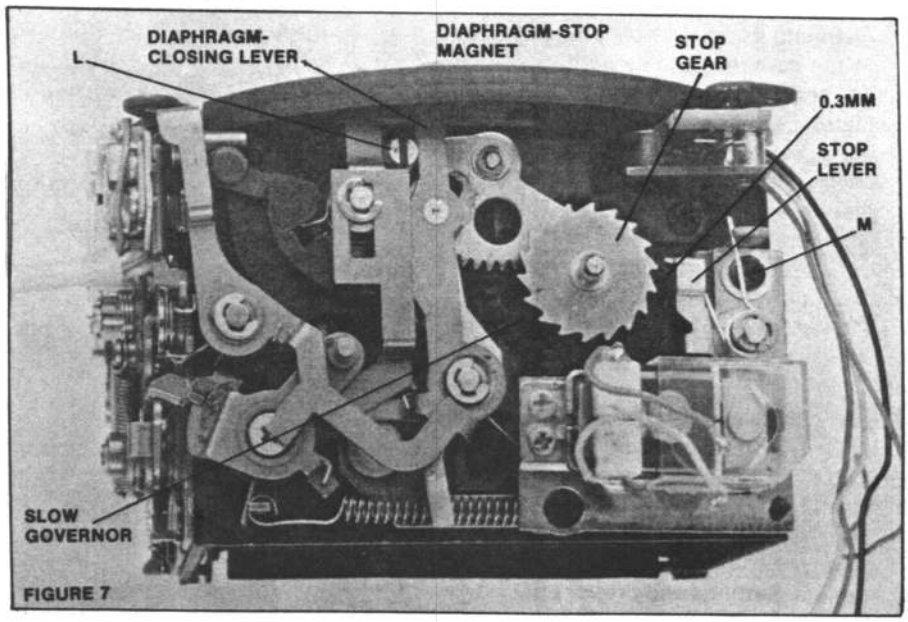

FIGURE 7

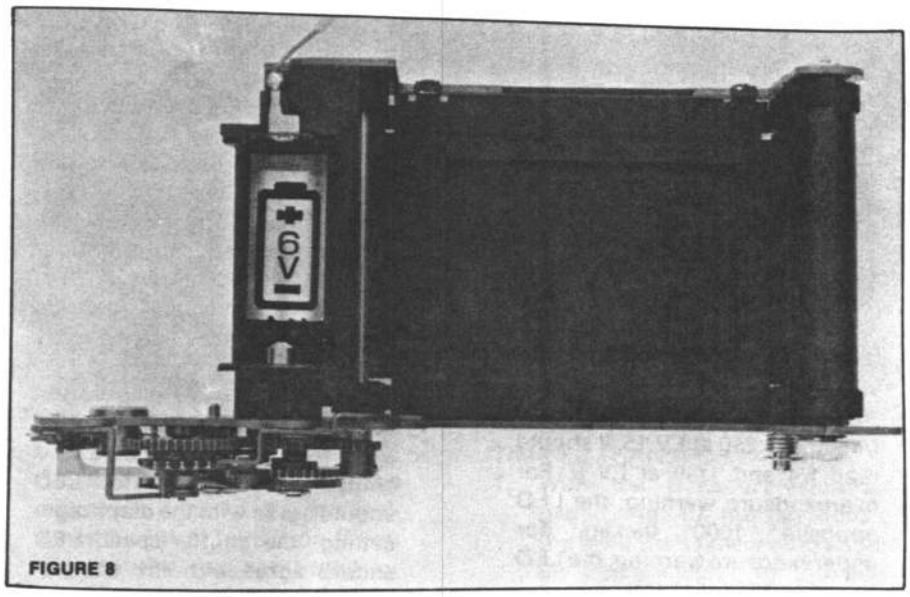

FIGURE 8

DISASSEMBLY HIGHLIGHTS:

Camera settings for disassembly: ASA 100 (for reference)

Locations of left-hand threads: power-winder coupler at bottom of wind shaft

Precautions:

1. After removing the bottom cover, be careful to avoid damaging the two blades of the piezo contact (beeper for self-timer), Fig. 2.

The piezo crystal remains in the bottom cover.

2. Remove the battery before unsoldering wires.
3. Do no unsolder the lead wires at the shutter magnets, Fig. 2; if you do, you may also disconnect the coil leads. Rather, unsolder the wires at the magnet board.

Sequence:

1. top cover — Fujica nameplate, wind lever, rewind knob, film-speed dial (white lock button loose), 6 screws (white rewind button and relay pin inside release button will be loose when you lift off top cover)
2. unsolder black ground wire and black X-sync wire, inside top cover
3. bottom cover (insulation plate over power-winder pins loose)
4. shutter-speed dial (E-clip, washer)
5. unscrew lock nut holding shutter-speed resistor plate
6. lift aside portion of flex that contains shutter-speed resistor plate
7. remove channel plate (flex connector) that clamps flex to E1 amplifier board, Fig. 1 (2 screws — loose insulator under channel plate)
8. unsolder wires from front of E1 amplifier board, Fig. 13 —
   —green to magnet board
   —2 gray wires to auto f/stop switch
   —blue, brown, and green to f-value resistor
   —white to lens coupler
9. unsolder 2 black wires from pentaprism bracket, Fig. 3 (to remove E3 circuit) —
   —black to E3 IC
   —black to lens-coupler switch
10. unsolder wires from E3 flex circuit (except blue wire already unsoldered from E1 amplifier board)
11. unsolder wires from terminals 10, 11, 12, 13, 14, and 15 of magnet board, Fig. 12
12. 2 sections, front leatherette
13. charge shutter
14. 4 front-plate screws
15. lift out front-plate/mirror-box assembly

Note: Before lifting out the front-plate/mirror-box assembly, you may wish to loosen the E1 amplifier board for additional clearance. Take off the on/off-switch brush and the film-speed brush by removing the press-fit retainer (loose insulator between the brushes). Then take out the two insulated screws.

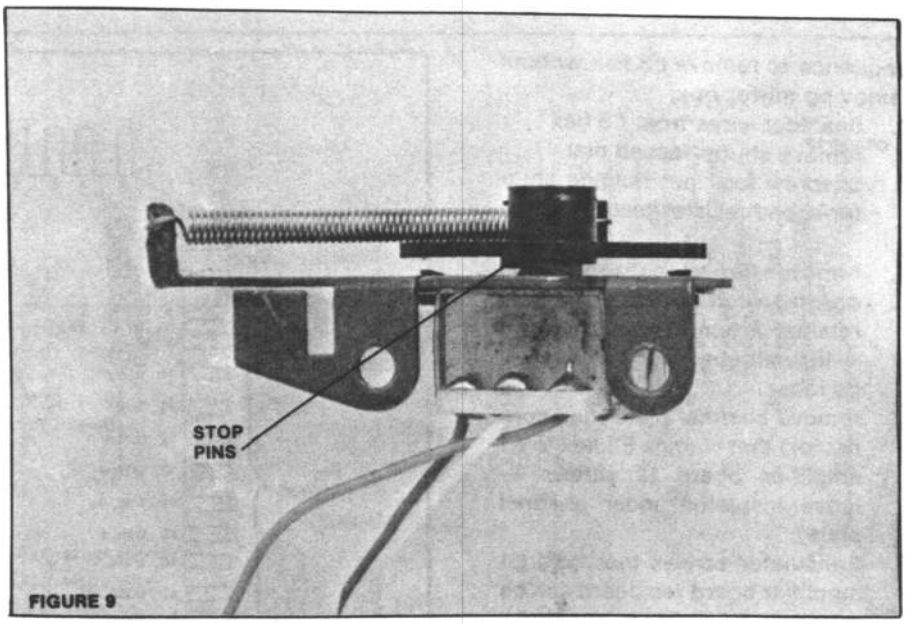

FIGURE 9

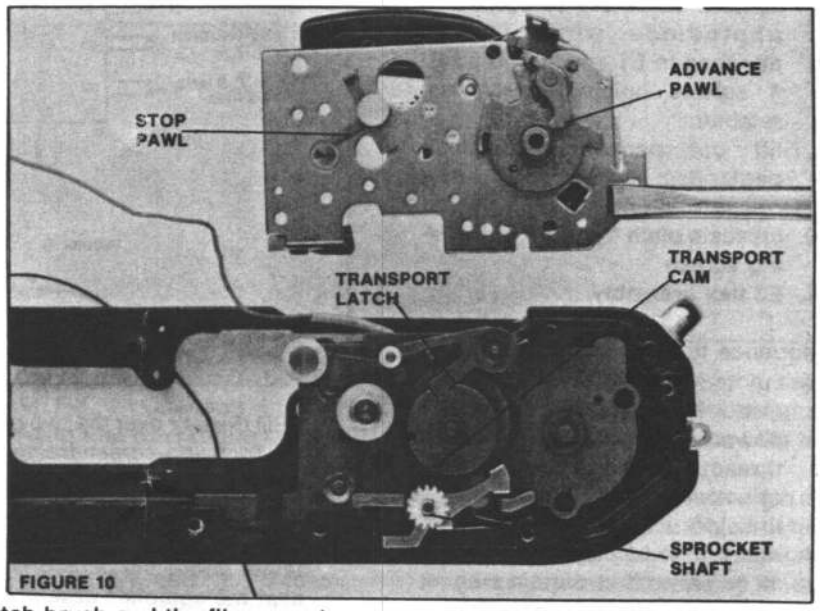

FIGURE 10

Sequence to disassemble mirror box:

1. 4 screws holding pentaprism bracket, Fig. 3
2. lift out the pentaprism, focusing-screen frame, and E3 flex circuit as a unit

   Note: You can also lift out the parts individually if it's difficult to remove them as a unit. Lift the pentaprism bracket, pentaprism cover, and pentaprism from under the E3 flex circuit. Then lift out the focusing-screen scale plate. The LED display, part of the E3 flex, fits over two pins on the focusing-screen frame.
3. f-value resistor (2 screws and wire clamp, Fig. 5)
4. wire clamp and wire-bundle retainer at bottom of mirror box (1 screw, Fig. 5)
5. lens-mounting ring and spacer (4 screws at front)
6. f-value ring
7. 4 mirror-box screws at front of front plate
8. 2 side screws holding mirror box (at tops of side panels, toward back)
9. separate mirror box from front plate (mirror-return spring, Fig. 5, will come disconnected, and switch pin in front plate, Fig. 3, will be loose)

Sequence to remove E3 flex without removing mirror box:

1. unsolder wires from E3 flex
2. remove shutter-speed dial
3. unscrew lock nut holding shutter-speed resistor plate
4. remove film-speed brush and on/off-switch brush (press-fit retainer around rewind bushing — insulator between brushes will be loose)
5. remove channel plate (flex connector) that clamps E3 flex to E1 amplifier board (2 screws — loose insulator under channel plate)
6. 2 insulator screws that hold E1 amplifier board (so board can be moved to clear eyelens assembly)
7. eyelens assembly (2 screws — photodiode wires remain attached to E1 amplifier board)
8. 4 screws holding pentaprism retainer
9. lift out pentaprism retainer, pentaprism cover, and pentaprism from under flex
10. lift scale plate from top of focusing screen
11. E3 flex assembly

Sequence to remove shutter assembly:

1. mirror box
2. power-winder coupler (left-hand thread), spacers, and wind gear at bottom of wind shaft
3. unsolder wires from terminals 16, Vcc, and 17 of magnet board, Fig. 12 (wires to first-curtain magnet and second-curtain magnet)
4. magnet-base plate (first and second-curtain magnets) at bottom of shutter (3 screws)

   Note: You can remove the shutter assembly without taking off the magnet-base plate. In the earlier design, the magnet-base-plate screw closer to the front of the camera is slightly longer and has a washer. The three screws are the same in the later design.
5. magnet board (unsolder remaining wires, remove 2 screws)
6. 3 screws at bottom holding shutter assembly (2 black, 1 silver)
7. slide out shutter assembly toward bottom of body casting

REASSEMBLY HIGHLIGHTS:

1. To reassemble the E3 flex assembly, first seat the two holes in the LED display over the two pins on the focusing-screen frame. Then replace the scale plate, the pentaprism, and the pentaprism cover. Place the pentaprism retainer above the pentaprism and seat the complete assembly as a unit.
2. Time the f-value resistor before replacing it on the mirror box. Fig. 9 shows the timing — rotate the gear until its stop pin is against the stop pin on the plate as shown. Then rotate the f-value ring in the front plate fully counterclockwise (as seen from the front). Seat the f-value resistor and replace its two screws. The f-value ring should now rotate freely in a clockwise direction and return fully counterclockwise under spring tension. Check the assembly by measuring the resistance between the blue wire and the white wire of the f-value resistor. You should measure around 2K. The resistance should decrease to 200 ohms or less as you rotate the f-value ring clockwise.
3. Replace the front-plate/mirror-box assembly with both the mirror box and the shutter cocked. To cock the mirror box, push forward the tensioning lever, Fig. 6. To cock the shutter, push the charge lever, Fig. 4, toward the back of the camera to disengage the transport latch. Then advance the wind lever. The mirror-return lever at the bottom of the camera, Fig. 4, must sit to the front of the mirror latch, Fig. 6.
4. After replacing the front-plate/mirror-box assembly, test the operation by supplying 3V to the magnets. First connect the power supply between the red (+) and blue wires of the mirror magnet; the mirror should rise. Release the first curtain and then the second curtain by pushing their respective armatures away from the magnets, Fig. 2. The mirror should now return to the down position. If the mirror doesn't return, the mirror-return

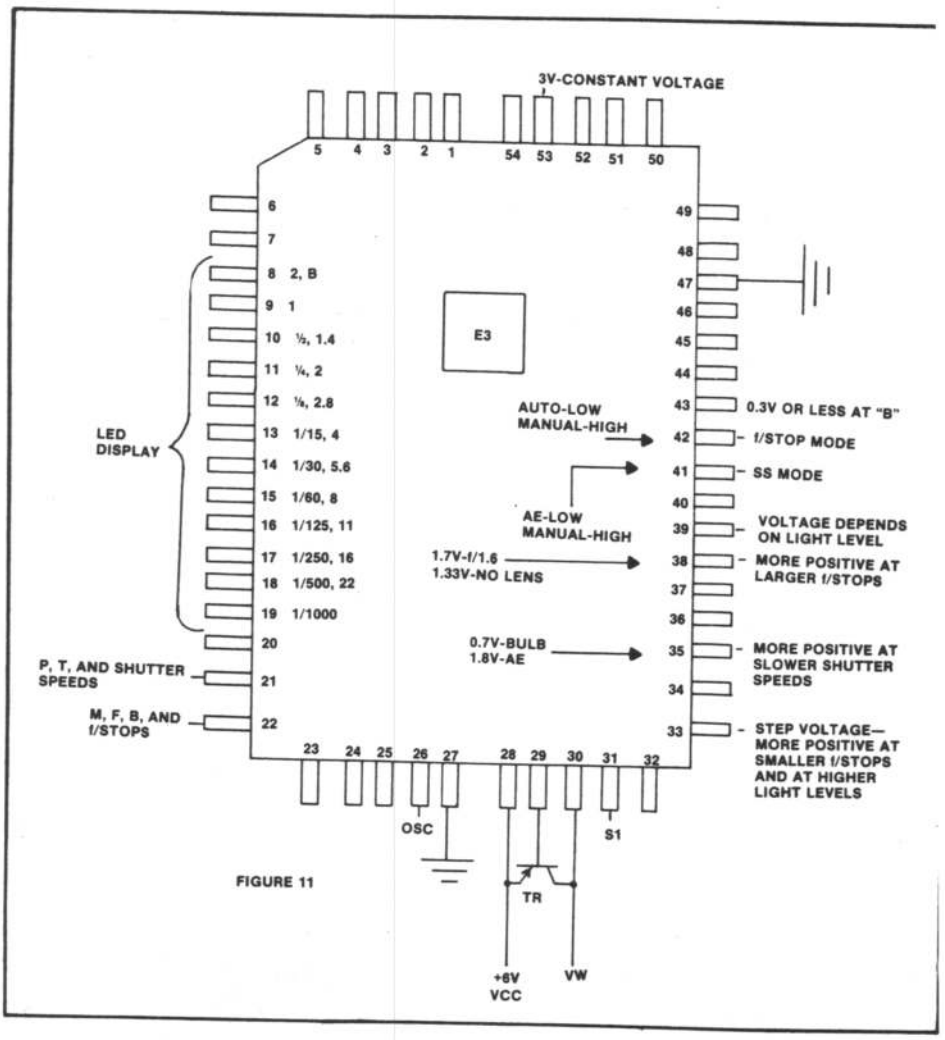

FIGURE 11

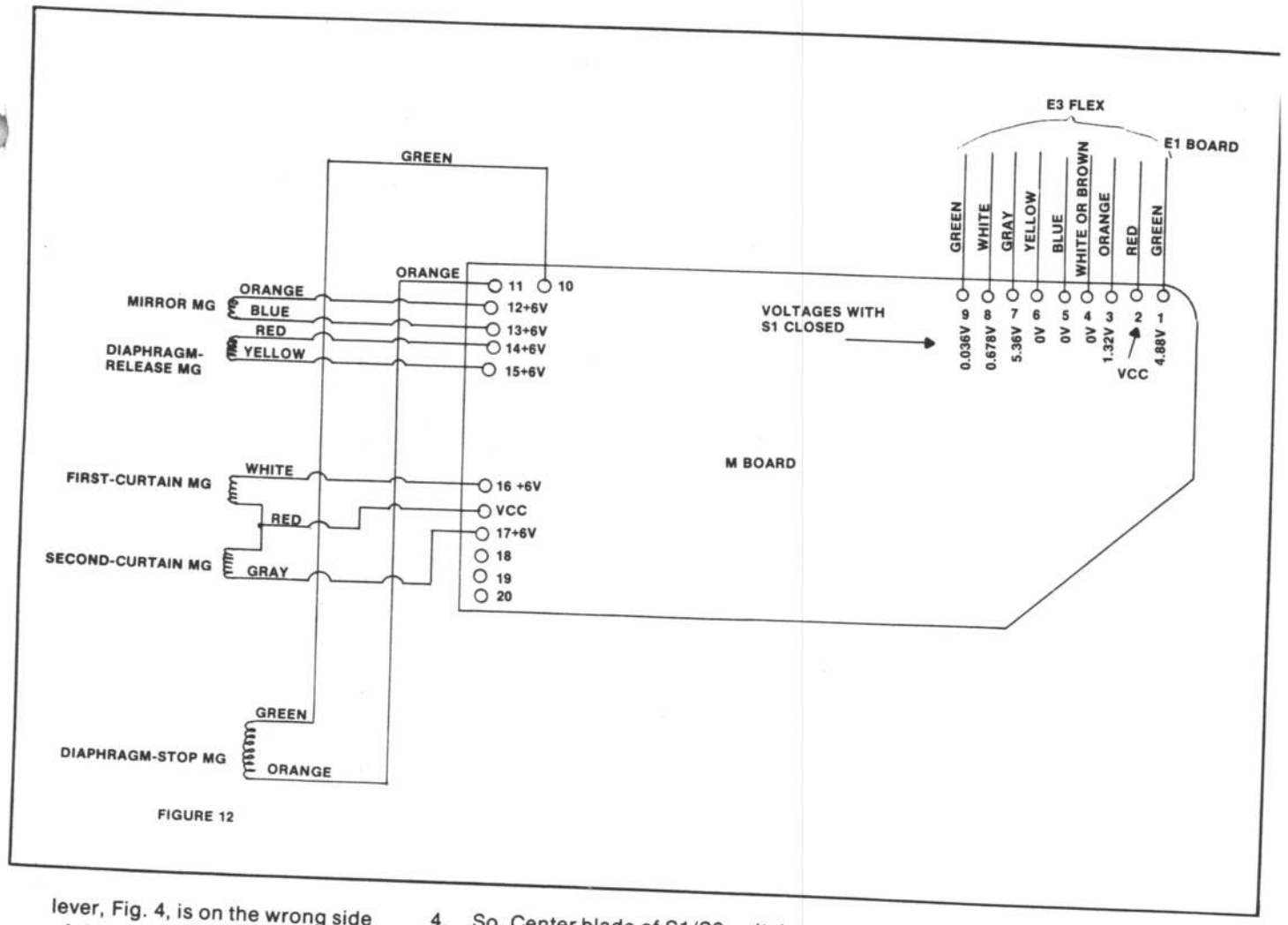

FIGURE 12

lever, Fig. 4, is on the wrong side of the mirror latch, Fig. 6.

TROUBLESHOOTING:

Maximum current draw (6V applied, S1 closed to turn on circuit) — 46ma

Behavior without battery: camera won't release, no LEDs

Behavior without lens: no f/stop or mode display in finder

Locations and functions of switches:

1. On/off switch. Brush at rewind end of camera. Connects the blue wire toward the back of the E1 amplifier board to ground in the "on" position.
2. Self-timer switch. When the on/off brush moves to the self-timer position, Fig. 1, it connects the blue self-timer land to ground, Fig. 13. The circuit then electronically delays the release and supplies the AC voltage that drives the piezo beeper.
3. S1. Metering switch. Top blade of S1/S2 switch block, Fig. 1. When the S1 contact touches the center So contact, the LED display should turn on.
4. So. Center blade of S1/S2 switch block, Fig. 1. Connects to the blue wire that runs to the on/off switch.
5. S2. Release switch. Bottom blade of the S1/S2 switch block, Fig. 1. Pushing the release button fully brings the S1 and So blades against the S2 blade to provide the release signal.
6. Preview switch. Next to the S1/S2 switch block at top of camera, Fig. 1. Closing the preview switch connects the S1 blade to ground, turning on the LED display.
7. S3. Shutter-cocked switch. Next to the S1/S2 switch block at front of camera, Fig. 3. Closed by the transport latch when the shutter reaches the cocked position to provide a current path when S2 closes. S3 must be closed before the shutter will release.
8. Sbf. Auto f/stop switch at back of mirror box, Fig. 5. Moving the diaphragm-setting ring of the lens to the diamond-marked position pushes in the switch pin, Fig. 3, to close both contacts of Sbf. Closing the switch programs the auto-diaphragm mode and causes the proper mode LED to turn on.
9. fo switch. Lens-coupler switch at front of mirror box, Fig. 3. With the lens removed, the switch prevents the f/stop and mode LEDs from turning on. Installing a lens brings a contact on the back of the lens against the fo switch. The fo switch now breaks the contact between the yellow wire and ground, turning on the f/stop and mode LEDs. Also, a fixed resistor inside the lens connects to the circuit through fo. The resistor value compensates for the maximum aperture.

Tips for troubleshooting without disassembly:

Check for proper sequencing (E3 circuit) by operating the camera at the 2-second setting. When the shutter releases, the LED display should turn out. The display should remain off for the length of the exposure.

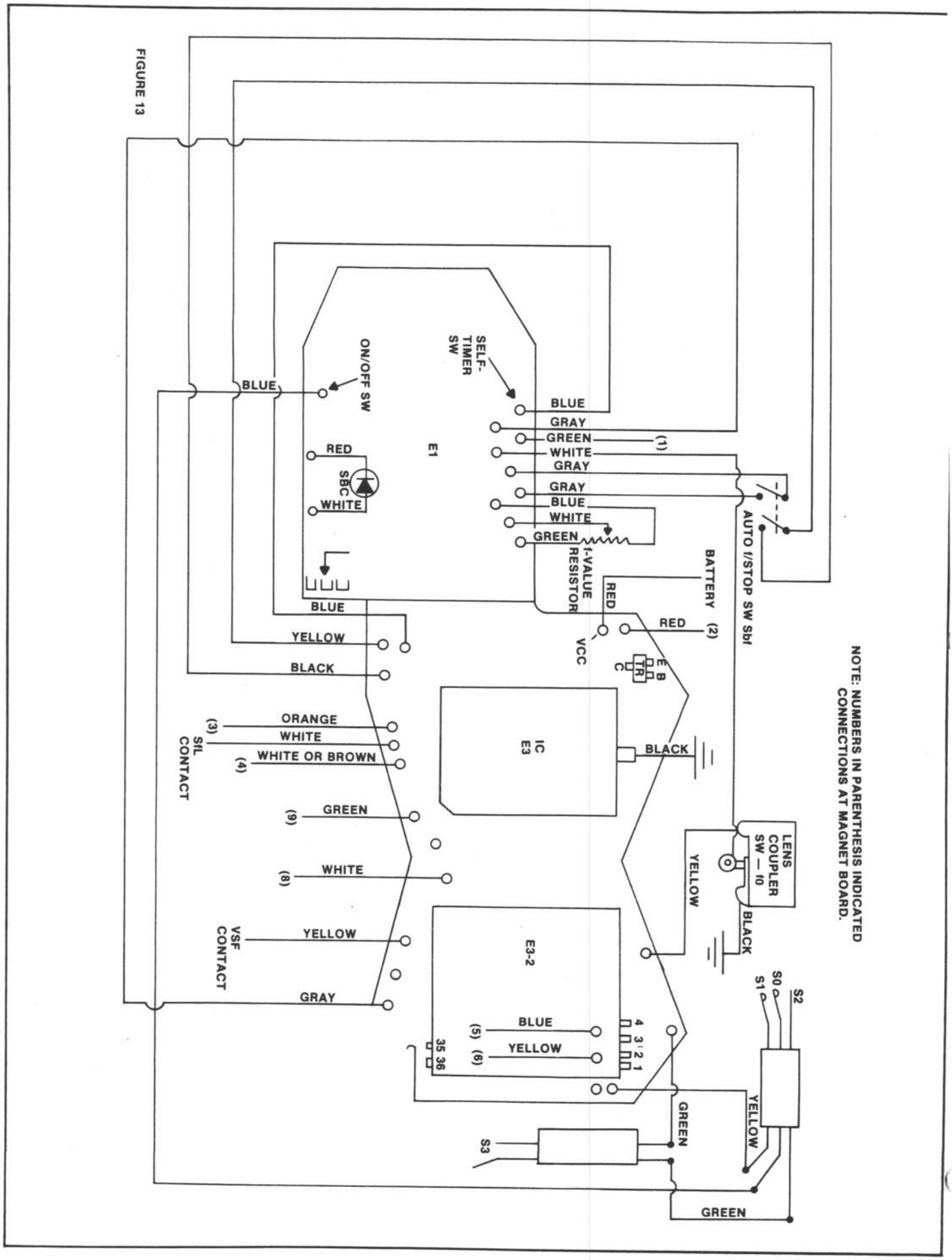
NOTE: NUMBERS IN PARENTHESIS INDICATED CONNECTIONS AT MAGNET BOARD.
BLUE
ON/OFF SW
SELF-TIMER SW
E1
BLUE
GRAY
GREEN
(1)
WHITE
GRAY
GRAY
BLUE
WHITE
GREEN
f-VALUE RESISTOR
RED
SBC
WHITE
BATTERY
(2)
RED
AUTO f/STOP SW Sbf
VCC
E B C TR
BLUE
YELLOW
BLACK
ORANGE
(3)
WHITE
WHITE OR BROWN
(4)
SfL CONTACT
IC E3
BLACK
LENS COUPLER SW — f0
YELLOW
BLACK
GREEN
(9)
WHITE
(8)
YELLOW
VSF CONTACT
GRAY
E3-2
4 3 2 1
BLUE
(5)
(6)
YELLOW
35 36
S0
S1
S2
S3
GREEN
YELLOW
GREEN

FIGURE 13

Troubleshooting steps for specific shutter and mirror problems:

1. Camera will not release, no LEDs

   Battery voltage to flex

   Check for battery voltage at the Vcc contact (red wire), Fig. 13. You should measure the full battery voltage regardless of switch positions. No voltage — check battery box and wiring.

   On/off switch, poor contact

   Check the continuity between the blue wire at the S1/S2 switch block, Fig. 13, and ground. You should get no resistance with the on/off switch in the "on" position, Fig. 1.

   Metering switch S1, poor contact or solder

   Check by shorting between the yellow wire and the blue wire at the S1/S2 switch block, Fig. 1. If the S1 switch is the problem, the LED display will then turn on.

   Transistor TR

   Check the voltage at the collector, Fig. 13. You should measure the Vw voltage (battery voltage minus the drop across the transistor) with S1 closed. If not, the problem could be a defective transistor or a defective IC E3; the IC supplies the base signal that turns on the transistor.

   Oscillator

   With S1 closed, you should get a square-wave signal at pin 26 of the E3 IC, Fig. 11 (two waves 4cm high at the scope settings of 1 volt per centimeter, 5 microseconds sweep time). Without a scope, check for an AC signal of around 1.2V at pin 26. No signal — E3 defective.

2. Camera will not release, LEDs work

   S3, not closing or poor contact

   S3, Fig. 3, should close with the shutter cocked. Check continuity between the green wire at the wind side of the flex and the green wire at the S1/S2 switch block; you should measure no resistance with the shutter cocked and infinite resistance with the shutter released.

   Note: In the new-style circuit, the S3 wiring goes through S2. In the old-style circuit, check S3 between the two green wires at the wind side of the flex.

   No voltage to magnet board

   Check for battery voltage at the red Vcc wires, Fig. 12. No voltage — check red-wire solder connections.

   S2 or IC E3-2

   Check by shorting the cathode end of the diode, Fig. 1, or pin 35 of E3-2, Fig. 13, to ground; the camera should then release when you close S1. If so, the problem is in the S2 switch or wiring. If not, E3-2 or the diode may be defective.

3. Camera releases when you close S1

   S3 touching ground

   Check to see if the insulator has come off the transport latch, Fig. 3. Also check to see if the green S3 wire is touching the blue wire of the S1/S2 switch block, Fig. 1.

   E3-2

4. Mirror rises, but shutter does not release

   Diaphragm-release magnet

   Check by shorting the yellow wire (terminal 15 of M board) to ground. The diaphragm system should operate, but the mirror should not rise. If not, check the continuity of the diaphragm-release magnet between the red wire (terminal 14) and the yellow wire (terminal 15). Approximate resistance of coil — 120 ohms.

   Magnet board

   Check by shorting the yellow wire (terminal 6 of magnet board) to the red Vcc wire. Result should be the same as when testing the diaphragm-release magnet. If not — yet the diaphragm-release magnet checks o.k. — the problem is the magnet board or the yellow-wire solder connections.

   IC E3-2

5. Mirror does not rise, and shutter does not release — but diaphragm stops down and reopens when you close release switches

   Mirror magnet

   Check by shorting the blue wire on the magnet board (terminal 13) to ground with the shutter cocked. The mirror should go up, but the shutter should not release until you close S1 and S2. If not, check the mirror-magnet coil. Approximate coil resistance — 120 ohms.

   Magnet board

   With the shutter cocked, short the blue wire (terminal 5) to the red wire (terminal 2). The mirror should rise. If not, yet the mirror magnet checks o.k., the problem is the magnet board.

   E3-2 IC

6. Diaphragm always stops down fully at the auto-diaphragm setting, LEDs o.k.

   Diaphragm-stop magnet or magnet board

   Check by cocking the shutter and shorting the green wire (terminal 1) to ground; you should hear a click as the diaphragm-stop magnet disengages. When you then release the shutter, the diaphragm should not stop down. Or, if the lens is removed, the diaphragm-stop lever should not move toward the front of the camera. If the diaphragm still stops down fully, either the magnet board or the diaphragm-stop magnet is defective. Check the diaphragm-stop magnet between the green wire and the orange wire, Fig. 12. Approximate resistance of coil — 120 ohms.

7. Diaphragm won't stop down, any setting

   Diaphragm-stop magnet, not holding armature

   Orange wires on magnet board reversed (terminals 11 & 12)

   Magnet board defective

8. Shutter delivers slow exposure (around 15ms) at 1/1000

   First-curtain magnet

   Check by shorting the white wire (terminal 16 of magnet board) to ground as you close S2. The mirror should rise, but the first curtain should not release until you remove the short. If the first curtain releases, check the coil of the first-curtain magnet between the white wire (terminal 16) and the red Vcc wire. Approximate resistance of coil — 800 ohms.

   Magnet board

9. Both curtains run together (no opening)

   Second-curtain magnet

   Check by shorting the gray wire

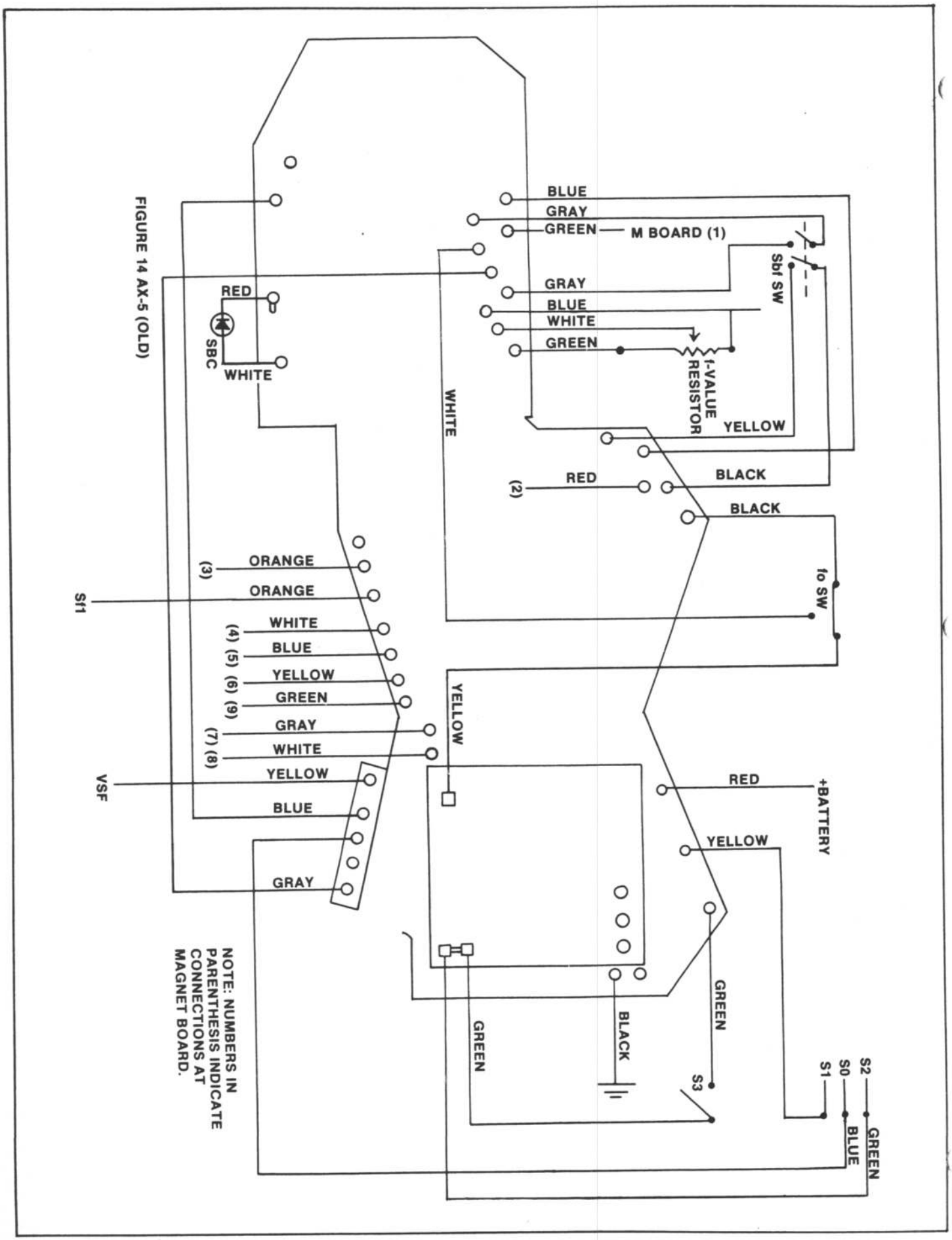

FIGURE 14 AX-5 (OLD)

(terminal 17 of magnet board) to ground as you close the release switches. The shutter should stay open for as long as you maintain the short. If not, check the continuity of the second-curtain magnet between the gray wire (terminal 17) and the red Vcc wire. Approximate resistance of coil — 800 ohms.

Magnet board

10. Mirror rises during cocking cycle

    Mirror magnet, not holding armature
    Check by pushing the tensioning lever, Fig. 6, toward the front of the mirror box; the armature should remain against the mirror magnet. If not, the permanent magnet may have lost its magnetism or the core/armature interface may be dirty.

    Latch engaging mirror-lifting lever, insufficient engagement

11. Diaphragm stops down during cocking cycle

    Diaphragm-release magnet, not holding armature
    Push the tensioning lever, Fig. 6, toward the front of the mirror box; the armature of the diaphragm-release magnet should remain against the core. If not, the permanent magnet may have losts its magnetism or the core/armature interface may be dirty.

12. Erratic shutter speeds

    1/1000 very fast — oil or dirt on first-curtain magnet interface

    1/1000 very slow — oil or dirt on second-curtain magnet interface

13. Erratic or incorrect diaphragm openings on auto-diaphragm setting

    Dirty interface, diaphragm-stop magnet

    Dirty or worn slow governor
    Clean and lubricate gear shafts with oil, Fig. 7. If the plastic gear is worn, replace the slow governor #46A2359220.

14. No bulb action

    Poor brush contact, shutter-speed selector
    Check the voltage at pin 43 of E3, Fig. 11. At the bulb setting, the voltage should be 0.3V or less. If not, remove the speed dial to clean and improve the brush contact.

    E3 IC

15. Piezo does not beep during self-timer operation

    Poor contact between piezo contact and bottom cover
    Bend out the two prongs of the piezo contact, Fig. 2, to make better engagement with the crystal. The crystal makes the ground connection through the bottom cover and bottom-cover screws.

    No signal to piezo contact
    Check for an AC voltage to the piezo contact during the self-timer operation; you should see the AC voltage start and stop to provide the beeping tone. No signal — check the solder connections of the green wire to terminal 9 of the magnet board. If o.k., the E3 IC may be defective.

16. No voltage at VSF contact

    Flex connector, poor contact

    Yellow wire, poor solder

    E1 circuit assembly

Troubleshooting steps for problems noted in LED display:

1. Shutter-speed LED does not change position at different shutter-speed settings

   Shutter-speed resistor, flex connector, E1 circuit, E3 circuit
   Check the voltage at pin 35 of the E3 IC, Fig. 11. The voltage should go more positive as you set slower shutter speeds. If not, check the contact between the shutter-speed brush (underside of speed dial) and the resistance band. Also check the contact between the flex and the E1 amplifier board (flex connector). If there's still no change at pin 35, the E1 circuit assembly may be defective. If the voltage at pin 35 does change, but the LED display does not change, the E3 circuit may be defective.

2. f/stop LED does not change position at different f/stop settings

   f-value resistor, poor contact
   If only the LED above f/22 turns on at manual f/stop settings, try shorting the white wire from the f-value resistor to the blue wire, Fig. 13. If the f/1.4 LED then turns on, the problem is poor contact in the f-value resistor (part #41A2025800) or poor solder.

   f-value resistor, open
   If only the f/1.4 or the f/2 LED will turn on, check the resistance between the blue and green wires of the f-value resistor, Fig. 13 (disconnect one wire). You should measure around 2K. If open, replace the f-value resistor #41A2025800.

   Flex connector, E1 circuit, E3 circuit
   Check the voltage at pin 38 of the E3 IC, Fig. 11; the voltage should go more positive as you get larger f/stops. If not, check the contact between the flex and the E1 amplifier board (flex connector). Still no change — E1 circuit assembly. If the voltage does change, the problem is in the E3 circuit assembly.

3. At auto settings, no change in LED position according to light travel

   Silicon photodiode or wiring
   Check the voltage at the SBC test point, Fig. 13. The voltage should go less positive as you increase the light level (around 0.2V at high light). No change — check the silicon photodiode and the wiring (red and white wires).

   Flex connector, E1 circuit, E3 circuit
   At pins 33, 34, 36, 37, and 39 of the E3 IC, Fig. 11, you should measure a voltage change with a change in light level. If not, check the contact between the flex and the E1 amplifier board (flex connector). Still no change — E1 circuit assembly. If the voltage does change, the problem may be in the E3 circuit assembly.

   Capacitor C12, Fig. 1 — poor solder connections

4. At AE setting, the shutter-speed indication remains at 1/1000 (flashing); at the auto-diaphragm setting, the f/stop LED remains above f/22 (flashing); diaphragm always stops down fully

   Film-speed resistor, poor contact

   Flex connector, poor contact

   E1 circuit assembly

5. At AE and auto-diaphragm settings, only the LED above f/22 turns on and flickers

   Auto f/stop switch, poor contact
   Short across the two gray wires going to the auto f/stop switch, Fig. 13. If the f/stop LED then moves properly (changes position with light-level changes), suspect poor contact in the auto f/stop switch, Fig. 5 (the contacts that connect to the gray wires). You should get direct contact between the two gray wires at the auto-diaphragm settings.

6. At auto-diaphragm and AE settings, the mode LED remains at "F" rather than changing to "P"

   Auto f/stop switch, poor contact
   Check between the yellow and black wires going to the auto f/stop switch, Fig. 13. You should get direct contact at the auto-diaphragm setting.

7. Mode LED and f/stop LEDs turn on with lens removed

   Lens-coupling (fo) switch, poor contact
   Check the resistance between the yellow wire from the lens-coupling switch, Fig. 13, and ground. You should get no resistance without a lens, infinite resistance (if the yellow wire is disconnected) with a lens.

8. f/stop LEDs on auto-diaphragm setting indicate too large an aperture

   Lens-coupling (fo) switch, poor contact
   Check the resistance between the white wire to the lens-coupling switch, Fig. 13, and ground. With the lens installed, and with the white wire disconnected, you should measure the resistance of the lens resistor (7.5K with the f/1.6 lens installed). Without the lens, you should measure infinite resistance with the white wire disconnected. Without the lens and with the white wire connected, you should measure around 3.9K.

9. Shutter-speed and f/stop LEDs don't lock on reading at AEL setting (they continue to change as light level changes)

   Shutter-speed selector, poor contact
   Check the voltage at pin 45 of the E3 IC, Fig. 11. At the AE setting, the voltage should be around 0.6V. The voltage should drop to less than 0.3V at the AEL setting. If not, check the brush contact at the underside of the speed dial.

   E3 circuit assembly

10. One or more LEDs in display won't turn on

    LED display or E3 circuit assembly
    You can supply power directly to each LED at the pins of IC E3, Fig. 11. Connect 1.5V in series with 1.5K current-limiting resistor. To check the shutter-speed LEDs, touch the negative lead to pin 21, Fig. 11, and touch the positive lead to the appropriate LED control pin. For example, applying power between pins 21 and 19 should turn on the 1/1000 LED. Touch the negative lead to pin 22 to check the f/stop LEDs. If one LED in the display is defective, it's necessary to replace the E3 flex.

OTHER COMMENTS:

1. You can clean the focusing screen without removing the top cover. Remove the two screws at the top front of the lens opening and drop out the focusing screen from inside the mirror box.
2. The circuits for the AX1 and the AX-3 are nearly identical to the AX-5 circuit. However, the other models don't have the two diaphragm magnets and the diaphragm switches for auto-diaphragm control.
3. Since the battery-box cover is a separate piece (rather than hinged), it can be lost by the owner. Part #12A2038410.

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